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Fetal biometry is assessment of fetal growth restriction in Telangana region

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Abstract--Background: Intrauterine increase restriction (IUGR) is most common complication in pregnancy and affects morbidity and mortality in any respect degrees of life. With current Doppler research of the fetal important circulation, inclusive of intracardiac flows and the ductus venosus, higher timing of shipping to decrease morbidity can be possible. Serial ultrasound measurements can offer an inexpensive estimate of fetal gestational age and weight primarily based totally on person and composite fetal biometric measurements. Materials and methods: This study consists of pregnant women who are attending OP /IP in department of OBG, SVS medical college, Mehabubnagar, Telanagana. All the retrospective USG quantitative data was noted in case proforma. Sample size was 100 in our study and was divided into cases and controls. Results: In 2nd trimester FGR parameters like FL (30.32), BPD (41.74), AC (136.34), HC (185.36) , GA (20.22) and EFW (310.04) were less when compared to normal fetus. In 3rd trimester we observed FL (61.44), BPD(79.64), AC(287.54) , HC(314.06) , GA (32.06) and EFW (1695.60) which were less when compared to normal fetus. Conclusion: that all the parameters in FGR from 2nd and 3rd trimester were less when compared to normal. A significant difference was observed in 3rd trimester variables. We didn't find significance in GA and HC in 2nd trimester between cases and controls while other parameters were statistically significant. fetal biometry is the one of the simple and accurate method to identify fetal

parameters to detect FGR and other congenital anomalies. Early diagnosis of and measures to minimize is necessary.

Keywords--FGR, Doppler, morbidity, fetal biometry, ultrasound, estimated fetal weight.

Introduction

Intrauterine increase restriction (IUGR) is most common complication in pregnancy and affects morbidity and mortality in any respect degrees of life. Historically, the control of IUGR has been depending on antenatal biophysical trying out and umbilical artery Doppler research. With current Doppler research of the fetal important circulation, inclusive of intracardiac flows and the ductus venosus, higher timing of shipping to decrease morbidity can be possible ¹. Intrauterine increase retardation has been divided into symmetric and uneven types. In the symmetric kind, the top and frame are each smaller than expected. This kind happens in approximately 25% of infants who've retarded increase in utero and is the end result of early and frequently extended fetal insult which includes maternal malnutrition, early and extended placental damage or predicament of the intrinsic increase capacity of a fetus with the aid of using a genetic or structural abnormality ².

Fetal weight may be measured ultrasonographically using envisioned fetal anthropometric measurements and population-primarily based totally increase charts. Estimated fetal weight (EFW) is typically used as an index of fetal increase and is generally calculated via a mixture of parameters that include, among others, stomach circumference. Nevertheless, each the EFW and stomach circumferences how a extensive variety of version that would potentially impact on scientific practice³⁻⁵. Error in EFW maybe as high as 25 %. Consequences from technical measurement errors, in addition to the assumptions that fetal density is constant during gestation and is unbiased of the fetal pathological approaches that regulate regular muscle/fat ratios ^{6,7}. Ultrasonography is the time-honored well known for tracking fetal growth. Serial ultrasound measurements can offer an inexpensive estimate of fetal gestational age and weight primarily based totally on person and composite fetal biometric measurements⁸⁻¹⁰.

Materials and Methods

This study consists of pregnant women who are attending OP /IP in department of OBG, SVS medical college, Mehabubnagar, Telanagana. Informed consent is taken from patients before collecting data. USG reports were collected from the patient's case sheet. All the retrospective USG quantitative data was noted in case proforma. Sample size was 100 in our study and was divided into cases and controls. Institutional ethics committee approved this study.

Results

The details of the USG readings of cases and controls in 2nd trimester are given in table-1. Gestational age (GA), estimated fetal weight (EFW), femoral length (FL),

biparietal diameter (BPD), abdominal circumference (AC) and head circumference (HC) in IUGR were less when compared to normal in second and third trimester. Independent t test was applied to the variables.

Table 1
Fetal biometry in 2nd trimester of normal and FGR

2nd Trimester	Groups	N	Mean	Std. Deviation	Std. Error Mean	" t "	P Value
GA	Cases	50	20.22	2.999	0.424	-1.395	0.166
	Controls	50	21.24	4.212	0.596		
EFW	Cases	50	310.04	114.309	16.166	-3.587	0.001
	Controls	50	451.10	253.527	35.854		
FL	Cases	50	30.32	8.561	1.211	-4.129	0.000
	Controls	50	38.68	11.474	1.623		
BPD	Cases	50	41.74	5.221	0.738	-3.742	0.000
	Controls	50	49.52	13.741	1.943		
AC	Cases	50	136.34	15.376	2.175	-5.07	0.000
	Controls	50	178.64	56.951	8.054		
HC	Cases	50	185.36	52.216	7.385	-0.584	0.560
	Controls	50	191.04	44.714	6.324		

Mean and SD of GA in cases and controls are 20.22 ± 2.999 and 21.24 ± 4.212 while HC in cases and controls are 185.36 ± 52.216 and 191.04 ± 44.714 . There is no statistical significance difference between cases and controls in GA and HC as $p > 0.05$. Mean and SD of FL in cases and controls are 30.32 ± 8.561 and 38.68 ± 11.474 . BPD in cases and controls are 41.14 ± 5.221 and 49.52 ± 13.741 . Mean and SD of AC in cases and controls are 136.34 ± 15.376 and 178.64 ± 56.951 . EFW in cases and controls are 310.04 ± 114.309 and 451.1 ± 253.527 . There is a statistical significance difference found between cases and controls in AC, FL, EFW and BPD as $p < 0.05$.

Table 2
Fetal biometry in 3rd trimester of normal and FGR

3rd Trimester	Groups	N	Mean	Std. Deviation	Std. Error Mean	" t "	P Value
GA	Cases	50	32.0600	0.79308	0.11216	-17.35	0.000
	Controls	50	36.3200	1.54444	0.21842		
EFW	Cases	50	1695.6000	166.56383	23.55568	-14.831	0.000
	Controls	50	2586.1600	390.57850	55.23614		
FL	Cases	50	61.4400	0.90711	0.12829	-9.989	0.000
	Controls	50	68.7800	5.11616	0.72353		
BPD	Cases	50	79.6400	1.75848	0.24869	-13.404	0.000
	Controls	50	88.1880	4.15248	0.58725		
AC	Cases	50	286.5400	11.25441	1.59161	-8.002	0.000
	Controls	50	314.7000	22.19234	3.13847		

HC	Cases	50	314.0600	14.61116	2.06633	-2.181	0.032
	Controls	50	320.3600	14.27680	2.01904		

Mean and SD of GA in cases and controls were 32.0600 ± 0.79308 and 36.3200 ± 1.544 . EFW in cases and controls were 1695.6000 ± 166.56383 and 2586.160 ± 390.578 . FL in cases and controls were 61.4400 ± 0.90711 and 68.7800 ± 5.11616 while BPD were 79.640 ± 1.758 and 88.188 ± 4.152 respectively. AC in cases and controls were 286.540 ± 11.254 and 314.700 ± 22.192 . Mean and SD of HC in cases and controls are 314.0600 ± 14.61116 and 320.3600 ± 14.27680 . all the variables showed a statistical significance between cases and controls ($p < 0.05$) as shown in table-2.

Discussion

Quality manage of fetal biometry facts also can be carried out through evaluation of intraobserver reproducibility (through reacquisition of photographs and through caliper placement on saved photographs through the equal operator) or interobserver reproducibility (through caliper placement through a 2nd operator¹¹. Crown-rump length is useful in determination of gestational age of 7-14 weeks and is optimal at 9-10 weeks within ± 4.7 days (± 2 standard deviation [SD])¹². An initial study of the fetal femur was conducted to identify dwarfism after the association between fetal development and increased femur length was established^{13,14}. However, subsequent studies showed an accuracy of ± 9.5 days (± 2 SD) at 12-23 weeks and expected a 3-33-1 / 2-week variation from the actual gestational age at 25-35 weeks gestation^{13,15}. FL was 30.3 and 61.4 in 2nd and 3rd trimester respectively in FGR in our study.

Biparietal parietal diameter is the most important column for determining gestational age. Measured at thalamic level from the anterior edge to the anterior edge of the parietal bone¹⁶. In FGR the BPD in our study was 41.7 and 79.6 which was when compared to normal. Correcting biparietal diameter measurements for changes in cranial shape that contribute to relative bilateral apex inaccuracy as a predictor of gestational age is age-corrected by growth-adjusted ultrasonography¹⁷. Abdominal fat mass was determined by measuring the thickness of the anterior abdominal subcutaneous tissue on the same axial image as the previously reported by Gardeil et al¹⁸. AC in our FGR group was 136 and 287 in 2nd and 3rd trimester which was less when compared to normal groups. The less than 10th percentile cutoff point for AC and / or EFW pregnancy is the definition generally accepted by FGR. However, the cutoff value for the 10th percentile depends on the graph you are using. In addition, most SGA infants have restricted non-growth at birth, and some FGR infants at risk of placental insufficiency or stillbirth due to placental insufficiency include AGA¹⁹. The lower the AC and EFW cutoffs, the higher the risk of actual FGR²⁰.

Conclusion

In our study we found that all the parameters in FGR from 2nd and 3rd trimester were less when compared to normal. fetal biometry is the one of the simple and

accurate method to identify fetal parameters to detect FGR and other congenital anomalies. Early diagnosis of and measures to minimize is necessary.

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